

What is claimed is:

1 1. A high-voltage-stable electrolyte for a lithiated
 2 intercalation secondary battery, said electrolyte consisting
 3 essentially of about a 0.5 to 2M solution of a solute
 4 selected from the class consisting of:
 5 a) LiPF_6 ; and
 6 b) mixtures of LiPF_6 with up to about equal mole parts
 7 of LiBF_4 ,
 8 dissolved in a mixture of non-aqueous dimethylcarbonate (DMC)
 9 and ethylene carbonate (EC) solvents wherein said solvents
 10 are present in a weight percent ratio range from about
 11 95 DMC:5 EC to 20 DMC:80 EC.

1 2. An electrolyte according to claim 1 for a secondary
 2 battery comprising a negative electrode and a positive
 3 intercalation electrode wherein the intercalation compound
 4 consists essentially of $\text{Li}_{1+x}\text{Mn}_2\text{O}_4$ wherein x is in the range
 5 of 0 to about 1.

1 3. An electrolyte according to claim 2 wherein said
 2 solvents are present in a weight percent ratio range from
 3 about 80 DMC:20 EC to 20 DMC:80 EC.

1 4. An electrolyte according to claim 3 selected from the
 2 group consisting of:

3 a) an approximately 1M solution of LiPF_6 in a solvent
 4 mixture of about 33 DMC:67 EC;

5 b) an approximately 1.5M solution of LiPF_6 in a solvent
 6 mixture of about 67 DMC:33 EC; and

7 c) 1M to 2M solutions of approximately equal parts of
 8 LiPF_6 and LiBF_4 in a solvent mixture of about 50 DMC:50 EC.

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 1 5. A lithiated intercalation secondary battery comprising a
 2 positive electrode, a negative electrode, and an electrolyte
 3 consisting essentially of about a 0.5M to 2M solution of a
 4 solute selected from the class consisting of:

- PS
 5 a) LiPF_6 ; and
 6 b) mixtures of LiPF_6 with up to about equal mole parts
 7 of LiBF_4 ,
 8 dissolved in a mixture of non-aqueous dimethylcarbonate (DMC)
 9 and ethylene carbonate (EC) solvents wherein said solvents
 10 are present in a weight percent ratio range from about
 11 95 DMC:5 EC to 20 DMC:80 EC.

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 1 6. A battery according to claim 5 wherein said positive
 2 electrode comprises an intercalation compound combined with
 3 about 3-10 weight percent carbon black and about 1-5 weight
 4 percent inert binder.

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 1 7. A battery according to claim 6 wherein said carbon black
 2 is present in about a 4-7 weight percent ratio.

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 1 8. A battery according to claim 6 wherein said
 2 intercalation compound consists essentially of $\text{Li}_{1+x}\text{Mn}_2\text{O}_4$
 3 wherein x is in the range of 0 to about 1.

1 9. A battery according to claim 8 wherein said solvents are
 2 present in a weight percent ratio range from about
 3 80 DMC:20 EC to 20 DMC:80 EC.

1 10. A battery according to claim 8 wherein said electrolyte
2 is selected from the group consisting of:

3 a) an approximately 1M solution of LiPF_6 in a solvent
4 mixture of about 33 DMC:67 EC;

5 b) an approximately 1.5M solution of LiPF_6 in a solvent
6 mixture of about 67 DMC:33 EC; and

7 c) 1M to 2M solutions of approximately equal parts of
8 LiPF_6 and LiBF_4 in a solvent mixture of about 50 DMC:50 EC.

1 11. A battery according to claim 8 wherein said negative
2 electrode consists essentially of a material selected from
3 the group consisting of carbon and lithium metal.

1 12. A battery according to claim 8 wherein said negative
2 electrode consists essentially of carbon and said electrolyte
3 consists essentially of an approximately 1M to 1.5M solution
4 of LiPF_6 in a solvent mixture of about 67 DMC:33 EC to about
5 33 DMC:67 EC.

1 13. A secondary battery comprising a negative electrode, a ✓
2 lithium intercalated positive electrode, and an electrolyte
3 comprising a solution of a lithium salt in a non-aqueous
4 solvent

5 c h a r a c t e r i z e d i n t h a t
6 said electrolyte consists essentially of an approximately 0.5
7 to 2M solution of a solute selected from the class consisting
8 of:

9 a) LiPF_6 ; and

10 b) mixtures of LiPF_6 with up to about equal mole parts of
11 LiBF_4 ,

12 dissolved in a mixture of non-aqueous dimethylcarbonate (DMC)
13 and ethylene carbonate (EC) solvents wherein said solvents
14 are present in a weight percent ratio range from about
15 95 DMC:5 EC to 20 DMC:80 EC.

1 14. A battery according to claim 13
 2 characterized in that
 3 said positive electrode comprises an intercalation compound
 14 4 combined with about 3-10 weight percent carbon black and
 L 5 about 1-5 weight percent inert binder.

1 15. A battery according to claim 14
 2 characterized in that
 14 3 said carbon black is present in about a 4-7 weight percent
 4 ratio.

1 16. A battery according to claim 14
 2 characterized in that
 3 said positive electrode intercalation compound consists
 H 4 essentially of $\text{Li}_{1+x}\text{Mn}_2\text{O}_4$ wherein x is in the range of 0 to
 5 about 1.

1 17. A battery according to claim 14
 2 characterized in that
 3 said electrolyte is selected from the group consisting of:
 P H 4 a) an approximately 1M solution of LiPF_6 in a solvent
 P H 5 mixture of about 33 DMC:67 EC;
 6 b) an approximately 1.5M solution of LiPF_6 in a solvent
 7 mixture of about 67 DMC:33 EC; and
 P H 8 c) 1M to 2M solutions of approximately equal parts of LiPF_6
 H 9 and LiBF_4 in a solvent mixture of about 50 DMC:50 EC.

1 18. A battery according to claim 14
 2 characterized in that
 3 said negative electrode consists essentially of a material
 4 selected from the group consisting of carbon and lithium
 5 metal.

H 1 19. A battery according to claim 14
2 c h a r a c t e r i z e d i n t h a t
3 said negative electrode consists essentially of carbon and
4 said electrolyte consists essentially of an approximately 1M
5 to 1.5M solution of LiPF_6 in a solvent mixture of about
6 67 DMC:33 EC to about 33 DMC:67 EC.

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